

1 SEPTEMBER 1997



Safety

INTERIOR SPRAY FINISHING

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The criteria in this standard are the Air Force's minimum safety, fire prevention, and occupational health requirements for interior spray finishing, the use of flammable and combustible materials and facility requirements for operations using these materials when applied as a spray. The spray can be propelled by compressed air, airless, electrostatic or other means in continuous or intermittent processes. The standard also covers the application of combustible powders by powder spray guns, electrostatic powder spray guns, fluidized beds, and electrostatic fluidized beds. *The standard does not apply to outdoor spraying operations on buildings, tanks, or other structures.* Major commands (MAJCOM), direct reporting units (DRU), and field operating agencies (FOA) may supplement this standard when additional or more stringent safety, fire prevention, and health criteria are required. Refer to Air Force Instruction (AFI) 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, for instructions on processing supplements or variances. Report conflicts in guidance between this standard, federal standards, or other Air Force directives through MAJCOM, DRU, or FOA ground safety offices to Headquarters Air Force Safety Center, Ground Safety Division, Safety Engineering and Standards Branch (HQ AFSC/SEGS), 9700 G Avenue, SE, Kirtland AFB NM 87117-5670.

This standard applies to all US Air Force organizations, including all US Air Force Reserve personnel and when Air National Guard personnel are on federal service. It provides guidance for painters and their supervisors engaged in interior spray finishing operation throughout the Air Force. It is intended to minimize or *eliminate* safety, fire, and health hazards to personnel and property associated with these operations. The standard implements those portions of Occupational Safety and Health Administration (OSHA) standards 29 Code of Federal Regulations (CFR) 1910.94, *Ventilation*, and 1910.107, *Spray Finishing Using Flammable and Combustible Materials*, applicable to Air Force interior spray finishing operations and in addition covers several items not addressed in the OSHA standards. It also implements those portions of other national safety consensus standards listed in the 'references' section of attachment 1.

NOTE. AFOSH 127- series standards are being converted to 91-series standards and the 161-series standards to 48-series standards. However, not all standards have been converted as of the effective date of this standard. To help you locate these documents, references to AFOSH standards are stated in the

updated series and standard number, with the outgoing series and standard number stated as “formerly designated as” in the ‘references’ section of attachment 1.

SUMMARY OF REVISIONS

Administrative changes have been made to update this standard to electronic format. Paragraphs have been renumbered and references updated. A glossary of references, abbreviations, acronyms, and terms is provided at attachment 1. Minor changes are annotated by a |.

Chapter 1

HAZARDS AND HUMAN FACTORS

1.1. Hazards . Painting, doping, and paint removal present hazards requiring effective controls. Hazards include exposure to toxic materials and flammable or explosive mists, particulates, and vapors. Inhalation of mists and vapors from nearly all paints, solvents, thinners, cleaning chemicals, strippers, and epoxies can be injurious depending upon the agent's toxic characteristics and the amount and method of exposure. Further, many can physically injure the skin and eyes, or be absorbed through the skin. Three of the more toxic pigment ingredients are lead, antimony, and chromates. Their use should be avoided. In addition, paints containing epoxy or polyurethanes can cause respiratory sensitization.

1.2. Controls. Potential physical and health hazards can be effectively controlled by appropriate work procedures, controls, facility design, and protective clothing and equipment.

Chapter 2

GENERAL REQUIREMENTS

2.1. Safety:

2.1.1. Pressure Equipment. Pressure equipment used in painting operations is hazardous because of the compressed air component; therefore, functional managers will assure that spray painting operations are closely supervised and equipment is in serviceable condition. On all air-type spraying equipment a pressure regulator valve will be installed in the air line between the compressor and painting equipment. A pressure relief valve and a pressure gauge will be installed between the pressure regulator and pressurized paint containers and (or) spray guns. Pressure relief valves will be set to open at pressures not more than 10 pounds above the required working pressure.

2.1.2. Other Equipment . Painter's ladders, scaffolds, lifelines, and other equipment will be inspected prior to use to be certain they are in safe condition. See AFOSH 91-22, *Walking Surfaces, Guarding Floor and Wall Openings and Holes, Fixed Industrial Stairs, and Portable and Fixed Ladders*, 91-31, *Personal Protective Equipment*, and 91-43, *Flammable and Combustible Liquids*.

2.1.3. Paint Mixing . Paint or dope mixing will be done in designated, adequately ventilated rooms constructed of fire-resistant materials. Mixing rooms will be provided with a floor drain to make it possible to wash down spills. Local installations must ensure that collection sumps are installed in the floor drain system and (or) that the waste water treatment plant can process the spillage. If this is not the case, local installations must develop alternate means of cleaning up the spillage. When possible, paint will be mixed in covered areas out of doors. All sources of ignition will be prohibited in mixing areas. All electrical fixtures or equipment in or within 20 feet of designated paint preparation areas will meet the requirements of National Fire Protection Association (NFPA) Standard 70, *The National Electrical Code (NEC)*, for Class 1, Division 1 locations.

2.1.4. Air Hoses . All hoses will be checked to assure they are properly connected to both their pipe outlets and the equipment to be used. Air hoses will not be connected to a pipe outlet unless the loose end is secured, since a loose hose connected to a compressed air outlet will whip. Compressed air will not be directed toward a fellow worker. Hose lines will be checked for evidence of wear and replaced as needed.

2.1.5. Housekeeping . Good housekeeping is essential to safe operations in paint and dope shops. Street clothing and protective clothing will be kept in separate lockers. Work clothing will be stored in metal lockers vented at top and bottom. Paint rooms, booths, etc., will be kept clean with equipment stored in a proper and orderly manner. All wiping rags will be kept in self-closing metal containers. Paint stored in work shops will be kept in tightly covered metal containers.

2.1.6. Protective Equipment. Personnel engaged in painting and paint removal will wear protective clothing, respiratory devices if required, and appropriate face, eye, and hand protection. Clothing will be changed, as needed, to minimize body contamination and reduce fire hazard. Personnel engaged in the application of dopes and paints will wear an apron or equivalent protection impervious to paints, solvents, and dopes. These aprons and clothing will be kept clean and when not in use, will be hung in ventilated metal lockers.

2.1.7. Eye Protection. Personnel, who are engaged in preparing surfaces for painting by abrasive techniques, will wear goggles to protect their eyes from chips and flying particles. Goggles and rub-

ber gloves will be worn while acids, lye, or noxious cleaning materials are being used. (Reference AFOSH Standard 91-31.)

2.2. Health:

2.2.1. Radioactive Luminous Paint . This type paint presents a potential health hazard and will not be used without approval of the base radiation protection officer. (Reference AFI 40-201, *Managing Radioactive Materials in the USAF*.)

2.2.2. Protective Creams . Hand protective creams are available and may be used by personnel engaged in cleaning and painting. These creams, when applied to the skin prior to painting operations, help protect the skin and facilitate the removal of contaminants by washing in water.

2.2.3. Respiratory Protection . The base bioenvironmental engineer will be consulted for specific advice on respiratory protection required for specific painting activities. Respiratory protective devices will satisfy the requirements of AFOSH Standard 48-1, *Respiratory Protection Program*. A program for the maintenance and care of respirators will be established by functional managers. Shop supervisors will ensure workers receive instruction in the care and fitting of respirators.

2.2.4. Personal Hygiene . Workers' hands and faces will be kept clean, clothes will be changed when contaminated, and hands and soiled objects will be kept out of the mouth. No food or drink will be brought into, or consumed, in paint and dope shops. Personnel will wash their hands prior to smoking or consuming food while in other areas.

2.2.5. Air and Water Pollution . Painting and paint removal operations can cause air and water pollution problems impacting both the base and the local community. Liquid, solid, and gaseous waste products from painting and paint removal operations will be disposed of according to local state air, water, and solid waste pollution control laws and as specified and approved by the base bioenvironmental and the civil engineer officials.

2.3. Fire Prevention and Protection:

2.3.1. Fire Prevention. Only essential fire prevention and protection items are included. Refer to AFOSH Standard 91-56, *Fire Protection and Prevention*, and NFPA Standards 10, *Standard for Portable Fire Extinguishers*, 13, *Standard for the Installation of Sprinkler Systems*, and 33, *Spray Applications Using Flammable and Combustible Materials*, for more detailed information. Painting operations of particular concern are those having a fire potential (i.e., paint removal, solvent wipe, and paint application by means of spray apparatus).

2.3.2. Paints . Certain paints, lacquers, dopes, varnishes, shellacs, solvents, thinners, and dilutants are very flammable. Others, under certain conditions, will burn violently. These, for the purpose of control, are classified as being flammable.

2.3.3. Paint Remover . Paint remover under certain conditions is combustible. Methylene chloride (Fed Spec TT-R-248) is one example of a combustible paint remover. It contains volatile combustible ingredients and the residue remaining after evaporation is also combustible.

2.3.4. Solvents . Solvent materials selected to do the residual cleanup, after the initial removal, will have a flashpoint of 140 degrees Fahrenheit (F) or above.

2.3.5. Methyl Ethyl Ketone . Solvent wipe-down of aircraft just prior to painting is done with Methyl Ethyl Ketone (MEK). This solvent is extremely flammable with a flashpoint of 160 degrees F.

At normal working temperatures, MEK presents a constant fire potential. Extreme caution must be employed to ensure there are no ignition sources in the area and ventilation is adequate to remove flammable vapors. Personnel will use approved respiratory protection and minimize skin contact.

2.3.6. Storage . Storage of paints and solvents will be according to AFOSH Standard 91-43.

2.3.7. Spray Painting . Spray painting presents varying degrees of fire hazards, depending on the materials used. Some are particularly dangerous and the same precautions pertaining to solvent wipe-down apply. Any material having a flashpoint below 140 degrees F should be handled very carefully and precautions are in order even for those having a flashpoint higher than this.

2.3.8. Housekeeping. Solvent or paint-soiled rags, paper towels, and craft paper can produce spontaneous ignition. Contaminated materials will be removed and placed in approved self-closing metal containers plainly marked to indicate the contents. At the end of each day or shift, these containers will be emptied or removed to an approved location outside the shop for pickup and disposal.

2.3.9. Sprinklers . Fire suppression sprinklers, installed in spray finishing areas will conform to NFPA Standard 13 provisions for extra-hazardous occupancy. Dry chemical, carbon dioxide, or halogenated extinguisher systems may be installed where automatic sprinkler protection is not available. (Refer to NFPA Standards 12, *Standard on Carbon Dioxide Extinguishing Systems*, 12a, *Standard on Halon 1301 Fire Extinguishing Systems*, 12b, *Standard on Halon 1211 Fire Extinguishing Systems*, or 17, *Standard for Dry Chemical Extinguishing Systems*.)

2.3.10. Extinguishers. Portable fire extinguishers shall be installed near all paint spraying areas. (Refer to AFOSH Standard 91-56.)

2.4. Ventilation Systems:

2.4.1. Ventilation . Only essential safety occupational health and fire protection items are included. For more details, including information on flow rate requirements, refer to AFOSH Standard 48-2, *Industrial Ventilation*. Ventilation and exhaust systems will be according to NFPA Standard 91, *Standard for Exhaust Systems for Air Conveying of Materials*, and will also conform to the provisions of this section. Mechanical ventilation will be in operation while spraying operations are being conducted and for a sufficient time thereafter to assure vapors are completely exhausted. Adequate conditioned makeup air must be provided.

2.4.2. Fan Unit . The fan-rotating element and its casing will be non-sparking. Ample clearances will be provided to prevent friction-caused fire hazards. Fan blades will be mounted on a shaft rigid enough to maintain alignment when the fan is operating under full load.

2.4.3. Exhaust Ducts . Exhaust ducts will be protected against mechanical damage, properly supported, and will normally have a separation of at least 18 inches from combustible materials. Ducts will be periodically inspected for accumulation of paint deposits and will be cleaned as needed.

2.4.4. Exhaust. Air exhaust from spray operations will be directed so it will not contaminate makeup air being introduced into the spraying area or other ventilation intakes. Unless the spray booth exhaust duct terminal is from a water wash spray booth, the terminal discharge point will be at least 6 feet from any combustible exterior wall or roof.

2.4.5. Drying . Freshly sprayed articles will be dried only in spaces with adequate ventilation to prevent the formation of explosive vapors. If adequate and reliable ventilation is not provided, such drying spaces will be considered a spraying area.

2.4.6. Motors . Electric motors driving exhaust fans will not be placed inside booths or ducts. Drive belts will not enter the duct or booth unless the belt and pulley within the duct or booth are enclosed or guarded.

2.5. Storage and Handling:

2.5.1. Storage . The quantity of paints, lacquers, thinners, solvents, and other flammable and combustible liquids kept near spraying operations will be the minimum required for operations but will not exceed 1 day's supply. Bulk storage of these liquids will be in a separate building detached from other buildings or in rooms specifically designed and constructed to meet flammable storage room requirements. Operations involving water-base latex paints are exempt from the above requirements. (Refer to AFOSH Standard 91-43.)

2.5.2. Containers. Original closed containers, approved portable tanks, approved safety cans, or a properly arranged system of piping will be used for bringing flammable or combustible liquids into spray finishing rooms. Open or glass containers will not be used.

2.5.3. Liquid Transfer . The withdrawal of liquids from containers and the filling of containers, including portable mixing tanks, will be done only in a mixing room or in a spraying area when the ventilating system is in operation. Precautions will be taken to protect against liquid spillage.

2.5.4. Grounding . Whenever flammable or combustible liquids are transferred from one container to another, both containers shall be effectively bonded and grounded. Piping systems used to transfer fluids will also be properly bonded and grounded.

2.6. Electrical:

2.6.1. Electrical Wiring . Electrical wiring and equipment shall conform to the provisions of NFPA 70. Electrical wiring located in spray areas must be in rigid metal conduit, Type MI cable, or in metal boxes or fitting containing no taps, splices, or terminal connections. There are alternative electrical wiring options when the location is adjacent to (rather than inside) a spray area. (Refer to NFPA 33.)

2.6.2. Electrical Equipment . Electrical equipment outside, but within 20 feet horizontally and 10 feet vertically, of any spraying area and not separated from it by partitions extending at least to the boundary of the Division 2 location shall be of non-spark-producing design. This equipment shall also conform to the provisions of NFPA 70, for Class 1 or Class 1, Division 2 locations as applicable. Refer to the illustrations in NFPA 33 for examples of how these space limitations apply. If spraying operations are confined to an enclosed spray booth or room, the space adjacent to the booth or room shall be considered non-hazardous except for the space within 3 feet in all directions from any opening in the booth or room.

2.6.3. Electric Lamps . Electric lamps outside of, but within 20 feet of any spraying area as defined in attachment 1, and not separated by a partition, shall be totally enclosed to prevent hot particles from falling should breakage occur and shall be protected from mechanical damage by guards or by location. Portable electric lamps shall not be used in any spraying area during spraying operations.

2.6.4. Grounding. All metal parts of spray booths, exhaust ducts and piping systems conveying flammable or combustible liquids or aerated combustible solids shall be electrically grounded.

2.6.5. Electric Heaters . If electric heaters are used to raise the temperature of the spraying media, they will be approved for the specific application and location. Heaters will not be used in spray

booths or other locations where combustible residues are present. Electrically powered agitators, if used, must meet the same approval criteria as the heaters.

2.7. Location of Paint and Dope Shops and of Spray-Finishing Operations:

2.7.1. Paint Shops . Paint and dope shops will be located in separated one-story buildings with fire-resistant floors, walls, and ceilings. They may be located in specially constructed rooms if they are separated from other operations by fire-resistant walls. Paint and dope shops will be provided with automatic sprinkler protection. Supervisors will avoid locating these shops near ignition sources. Refer to NFPA 33, Appendices A & B for additional information.

2.7.2. Spray Booths . When possible, paint spray booths will be located in the paint and dope shop. All spray booths will be installed to conform to NFPA 33 and the provisions of AFOSH Standard 48-2. In industrial facilities, spray-finishing operations will be located and protected to minimize possible damage to other property by fire or by extinguishing agents.

2.7.3. Prohibited Locations . Spray-finishing operations will not be conducted in a building classified as administrative, educational, or public assembly, unless a room is specifically designed for the purpose, is protected with an automatic sprinkler system, and is separated vertically and horizontally from such occupancies by not less than 2-hour fire-resistance construction.

Chapter 3

SPECIFIC APPLICATIONS

3.1. Spray Painting of Aircraft:

3.1.1. Aircraft Painting . Spray painting of an entire aircraft is permitted only in hangars specifically designed for this purpose. When such work is performed, the aircraft will be isolated and adequate fire prevention measures taken. Ventilation will be provided and the bioenvironmental engineer will periodically check for adequacy of ventilation according to AFOSH Standard 48-2. The aircraft will be properly grounded and all sources of ignition removed from the area. All electrical devices and equipment will be of an approved explosion-proof type. Except when essential to perform concurrent operations, all aircraft electrical systems will be deenergized during cleaning, painting, and paint removal. Smoking will be prohibited. To prevent the accumulation of static charges, all materials or objects will be effectively grounded.

3.1.2. Housekeeping . All spraying areas will be kept free from the accumulation of deposits of combustible residues. Cleaning will be conducted daily, if necessary. Scraping tools will be non-sparking. The use of solvents for cleaning operations is restricted to those having flashpoints at or above 100 degrees F. Roof trusses, light fixtures, and other overhead equipment should be checked for accumulation of overspray at least annually. Rags, waste, and other paint and dope-saturated materials will be placed in metal safety containers with self-closing lids. These containers will be emptied daily.

3.1.3. Limited Painting . (Refer to TO 42A-1-1.)

3.1.4. Grounding . Whenever operations involving sanding, rubbing, or wiping surfaces are to be performed, the aircraft surfaces will be grounded to preclude the build-up of static electricity.

3.2. Painting Radio and Radar Equipment:

3.2.1. Procedures . The paints used to spray coat radio and radar equipment are very flammable and will NOT be used near open flames. Smoking will be prohibited within 50 feet of painting operations. Because these paints are also toxic, they will be used only in ventilated spray booths.

3.2.2. Personal Protection. Paint shop personnel will wear approved respiratory protective devices as recommended by bioenvironmental engineering. While painting, personnel will wear gloves or will coat their hands with approved creams to guard against skin irritation (refer to paragraph 2.2.2).

3.2.3. Drying . Radio and radar equipment which has been spray painted will be placed in the open air for several hours or, if possible, for a full day. This will prevent vapors given off during the drying process from being ignited by sparks generated when the equipment is put into operation. Emery paper or steel wool will not be used on radio or radar equipment until the vapors have totally dissipated.

3.3. Electrostatic Paint Spraying:

3.3.1. Principle . In electrostatic paint spraying, particles of paint at a low velocity are passed through a negatively charged electrostatic field. The particles of paint assume the negative polarity of the electrodes and are then attracted to the work, which is positively charged, usually by being attached to a grounded conveyor.

3.3.2. Fire Prevention . Fire hazards involved in electrostatic paint spraying result from (a) the solvents used with the paint; (b) from possible sparking of the unit; and (c) from use of oil-filled transformers. Fire-protective equipment should be checked regularly with particular attention given to automatic sprinkler heads. Sprinklers protecting spraying areas must be kept free from deposits by frequent or, if necessary, daily cleaning. An adequate supply of portable fire extinguishers shall be available for use. Refer to AFOSH Standard 91-56.

3.3.3. Daily Inspection . The entire electrostatic unit should be checked daily, with attention given to the electrical terminals, electrodes, and insulators. On humid days, condensation should be carefully removed from insulators. The conveyor system should be checked for jerky operation, loose hooks, or other defects that could permit swinging of the units being painted. Spraying equipment, including spray gun tips, should be checked. Moisture should be removed from the compressed air storage tanks.

3.3.4. Insulators. The insulators on electrodes and conductors should be kept dry and be cleaned frequently to prevent flashover.

3.3.5. Maintenance . Before cleaning a nozzle or attempting any work on a gun, the power unit and ground nozzle should be turned off to discharge any remaining charge within the system. Maintenance should not be done until enough time has elapsed to permit the solvent vapors to be drawn out of the area. In the absence of automatic grounding equipment, sufficient time will be allowed to permit any remaining electrical charge to drain off through normal paths. During cleaning operations, only approved spark-resistant tools should be used.

3.3.6. Grounding . Manual grounding wires should always be available, and employees who work with electrostatic equipment should be familiar with their use. All metal parts, including guard rails, shields, barriers, and enclosures in the vicinity of a unit, must be grounded to prevent static buildup.

3.3.7. Manual Spraying . During manual spraying operations, painters must hold electrostatic spray guns in their bare hands. Spray room floors will be grounded. When a gun is not in use, it will be hung so the nozzle is within 4 inches of a grounded conductor.

3.3.8. Personnel . Only properly trained, qualified, and physically-fit persons should be permitted to work around electrostatic apparatus. Medical examinations as needed will be scheduled by base medical services.

3.3.9. Warning Signs . Signs designating the process zone as dangerous will be posted. A red “on” light interlocked into the power transformer circuit will also be provided.

3.4. Airless Paint Spraying:

3.4.1. Principle . The principle of the airless spray method is to force paint through a small orifice at pressures from 1,800 to 4,000 per square inch (psi). An electric or air-powered pump increases the hydraulic pressure in the paint container and forces the paint (which may be heated to decrease its viscosity) from the spray gun. When the paint is forced through the orifice under high pressure, it expands and breaks into small particles. The atomized particles have enough velocity to carry them to the surface to be painted, but not enough to rebound. A spray pattern of wide coverage is created rapidly and with very little mist. Since the pattern has unusually sharp clean edges, masking and shielding are not necessary on most jobs.

3.4.2. Operation:

3.4.2.1. Never point an airless spray gun at any part of the body. Paint can be hypodermically injected into the body by the high operating pressures.

3.4.2.2. Do not disconnect the gun from the fluid hose or the hose from the pump until the pressure has been released from the hose. This is accomplished by first closing off the main line air pressure to the pump and then bleeding off the pressure in the fluid hose by triggering the gun before disconnecting it.

3.4.2.3. When handling the gun but not actually spraying (e.g., when changing parts or work position), hold the gun by the grip and remove the fingers from the trigger. This will prevent the gun from being activated if the operator's hold should inadvertently tighten due to slipping or stumbling. **NOTE:** Guns should be equipped with trigger guards and a safety lock. The lock should be in the non-operating position except when the gun is actually in use.

3.4.2.4. Check all hose connections and fittings to make sure they are tight and not leaking. **NOTE:** The fluid hose must be designed to withstand the high pressure to which it is subjected. The hose, gun, and pressure vessel should be equipped with special fittings that are not interchangeable with low pressure fittings.

3.4.2.5. Check the fluid hose to be sure that there are no weak or worn spots. Make certain the hose does not contact moving parts of machinery, lie over or around sharp edges and corners, or come near objects that would damage it. Check for deterioration caused by exposure to chemicals or ordinary wear and tear. High-pressure leaks from the hose or from the connections can also cause hypodermic injection

3.4.2.6. Never pass the finger over the gun orifice to clean it, as this will result in hypodermic injection of paint into the finger. Consult the manufacturer's operating manual for cleaning procedures.

3.4.2.7. Ground the object being sprayed as well as the spray gun, to prevent static electricity from being created. A static electricity discharge could cause an explosion of the vapors contained in the confined atmosphere. Fluid hoses are available with a ground wire that will prevent the accumulation of a static charge when the airless unit is grounded and the object being sprayed is also grounded. Perform periodic continuity checks to ensure the hose ground wire is intact.

3.4.2.8. Ensure the operator wears eye protection and gloves to guard against accidental contact with the spray. Also ensure respiratory protective equipment is worn if exhaust ventilation is not available.

3.5. Paint Spray Booths:

3.5.1. Construction. Refer to AFOSH Standard 48-2 for details of construction and installation of ventilating systems for paint spraying operations. Illustrations of both dry and water wash paint spray booths are included in AFOSH Standard 48-2.

3.5.2. Exhaust Filters :

3.5.2.1. Filter pads and filter rolls shall be inspected after each painting operation and replaced when necessary.

3.5.2.2. Interlocks will be used with automatic-advance roll filters to stop the spraying operation should the roll advance mechanism fail to work.

3.5.2.3. Filter pads and rolls will be made of noncombustible materials.

3.5.2.4. Both filter pads and rolls shall be changed when changing from one type coating material to another if the two materials are chemically dissimilar and susceptible to spontaneous combustion when in contact with each other.

3.5.2.5. Discarded filter pads and rolls will be removed from the area daily unless water-filled metal containers are provided to hold them safely immersed until disposal.

3.5.3. Baffle Plates . Baffle plates, if used, shall be made of noncombustible material and readily removable or accessible on both sides for cleaning. Such plates shall be grounded.

3.5.4. Extinguishers . Portable fire extinguishers, adequate to handle the most flammable of the coating materials being used, will be provided. (Refer to AFOSH Standard 91-56.)

3.5.5. Floor Covering. It is desirable that the floor of paint spray booths be covered with a noncombustible mat, removable for cleaning or disposal.

3.5.6. Flame-Producing Devices. Using or carrying of matches, lighters, or other spark or flame-producing devices in or adjacent to paint spray booths is prohibited.

3.5.7. Containers . Containers supplying spray nozzles will be of closed type or provided with metal covers which will be kept closed. Original shipping containers will not be subjected to air pressure above atmospheric for supplying spray nozzles. Containers under pressure exceeding atmospheric pressure will be designed and approved for such use, will be provided with a visible pressure gauge, and will be provided with both a relief valve and a shut-off valve.

3.5.8. Hoses and Couplings . Pressure hoses and couplings will be regularly inspected for condition and will be replaced as needed. When positive displacement pumps are used, a relief valve will be installed in the discharge line to prevent overpressure.

3.6. Portable Paint Spray Equipment :

3.6.1. Description . Such equipment consists of an air compressor, paint spray gun, and hose. The paint reservoir on most portable spray guns holds 1 quart of fluid or less. When a considerable amount of paint is to be applied, a 2-1/2 or 5-gallon pressure tank is usually employed.

3.6.2. Compressor . The air compressor will be equipped with an American Society of Mechanical Engineers (ASME)-rated air tank, a visible pressure gauge on the tank, a pressure reducer with its own gauge, a guard fully enclosing the drive belt and pulleys, and a pressure-limiting switch to shut down the compressor when the system's working pressure has been reached. The equipment should be securely mounted on a wheeled carriage for portability. For interior painting, only electric motor-driven equipment will be used.

3.6.3. Overpressure Protection . When separate paint pressure tanks are used, they will be equipped with a gauge and a relief valve to prevent overpressure. Hoses will be rated for the maximum working pressure of the system.

3.6.4. Maintenance:

3.6.4.1. A preventive maintenance program will be implemented by all organizations using this equipment to cover periodic inspection and testing of all components.

3.6.4.2. Storage of compressors, hoses, paint pressure tanks, and spray guns will be in areas designated and approved by the base civil engineer.

3.6.4.3. All paint pressure tanks and spray guns will be cleaned after usage and before the equipment is stored. If solvents are used in the cleaning process, provisions of AFOSH Standard 91-43 will be followed.

3.7. Aerosol Cans of Spray Paint :

3.7.1. Availability. One-pint pressurized cans of general purpose spray lacquers or enamels are available through the GSA supply system. The lacquers are available in acrylic, styrene/acrylic, and nitrocellulose bases in a variety of colors.

3.7.2. Precautions. The same general safety and health precautions apply to spray painting from pressurized cans as to spray painting by other means. The following specific items are noted:

3.7.2.1. Storage:

3.7.2.1.1. Pressurized cans of spray paint are to be considered flammable materials and stored according to criteria in AFOSH Standard 91-43.

3.7.2.1.2. Office desks are not to be used for the storage of pressurized cans of spray paint.

3.7.2.1.3. Office storerooms are not to be used for the storage of pressurized cans of spray paint unless the storage area has been designated safe for the storage of flammable materials by local fire department personnel.

3.7.2.2. Disposal:

3.7.2.2.1. Disposal of empty cans will be according to criteria in AFOSH Standard 91-43.

3.7.2.2.2. Disposal of malfunctioning cans still containing paint under pressure will be according to AFOSH Standard 91-43.

3.7.2.2.3. Office waste cans will not be used for the disposal of cans of spray paint nor for the disposal of wiping rags and other waste material.

3.7.2.2.4. Disposal of wiping rags and other waste materials will be in self-closing metal containers labeled to indicate the content.

3.7.2.3. Protective Equipment. The same general rules governing the use of personal protective equipment apply to painting with pressurized cans. Refer to other sections of this standard and to AFOSH Standard 91-31.

3.8. Drying Ovens. Most drying ovens use gas or electricity to heat air which is blown across the components being dried. There are also infrared and microwave drying ovens in commercial use. Refer to the manufacturer's data sheet for the specific equipment to use. The following general safety principles apply to all:

3.8.1. When used to dry flammable finishes, the ovens must meet or exceed NFPA 86, *Standard for Ovens and Furnaces*, requirements for Class A ovens.

3.8.2. Avoid using spray booths or rooms for drying purposes. Raising the temperature of a spray booth increases the chance of spontaneous combustion of paint residues.

3.8.3. Do not install drying ovens in a spraying area if the oven contains an open flame or a spark-producing element.

3.8.4. Adequately vent the exhaust air from the oven. Preferably, the oven should have its own ventilation system. If spray booth ventilation systems are utilized, the oven vent must enter the system downstream from filters and baffles. In addition, an interlock must be installed which will automatically start the blower any time the oven is turned on and which will automatically shut down the oven if the blower stops operating, either by accident or by intention.

3.8.5. Make sure electrical wiring for drying ovens and associated equipment conforms to NFPA 70.

3.8.6. Ensure metal parts of drying ovens are bonded and grounded.

3.8.7. Never conduct spraying operations in proximity to an operating drying oven.

3.8.8. Post adequate signs in the vicinity of operating drying ovens to warn of heat and to caution against conducting spraying operations.

3.9. Powder Coating:

3.9.1. Principle . These operations deposit air suspended powders on components in specially constructed containers called fluidized beds. Some beds are designed to place an electrostatic charge on the powder and the opposite charge on the component being coated. These aerated solid powders must be trapped and not allowed to escape to the atmosphere. Refer to manufacturer's specifications for each unit used. Also consult NFPA 33.

3.9.2. Safety and Health . The following general safety and health principles apply:

3.9.2.1. Forced exhaust ventilation is mandatory to maintain a safe atmosphere. Collectors must be incorporated with the ventilation system to trap all excess powder.

3.9.2.2. Housekeeping is important. The area will be kept free of powder dust. Water-saturated cleaning cloths will be used to remove powder dust and to preclude scattering dust elsewhere.

3.9.2.3. Electrostatic fluidized beds utilize transformers and other electrical devices to generate the voltages required to operate this equipment. These devices must all be located outside the powder coating area.

3.9.2.4. All metal parts of the fluidized bed will be electrically bonded and grounded. In addition, components being coated will also be grounded.

3.9.2.5. When electrostatic hand guns are used, the handle of the gun will be grounded and the operator will grasp the handle bare-handed to preclude any buildup of static electricity.

3.10. Organic Peroxide Coating:

3.10.1. Principle . This type coating is applied using a special purpose spray gun. The peroxide acts as a catalyst and is introduced through one nozzle of the gun. A second material, a polyester, is introduced through a second nozzle. When the two mix at the application point, a chemical reaction occurs producing a plastic polymer coating. Refer to the manufacturer's label on the cans for the specific material in use. Also refer to NFPA 33.

3.10.2. Safety and Health . The following general safety and health provisions apply:

- 3.10.2.1. Do not interchange equipment used for organic peroxide coating with that used for any other application.
- 3.10.2.2. Peroxides are oxidizers and must not be mixed with other materials. Promptly clean up any overspray or spills. Use noncombustible absorbent material for cleanup purposes. Dispose of this material according to the manufacturer's recommendations.
- 3.10.2.3. Do not store or place organic peroxide materials near any source of heat. Avoid rough handling, since these materials are sensitive to shock.
- 3.10.2.4. Prohibit smoking. Post "NO SMOKING" signs in any area where organic peroxides are stored, mixed, or applied.
- 3.10.2.5. Use non-sparking tools in areas where these materials are stored, mixed, or applied.
- 3.10.2.6. Ensure respirators, gloves, and protective clothing are used. Consult bioenvironmental engineering for approved types.
- 3.10.2.7. Assure all spraying operations involving the use of organic peroxides are conducted in sprinklered spray booths meeting the requirements of AFOSH Standard 48-2.
- 3.10.2.8. Make sure workers keep only the minimum quantity of peroxides needed for daily operations in the processing area.

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Chief of Safety

Attachment 1

GLOSSARY OF REFERENCES, ABBREVIATIONS, ACRONYMS, AND TERMS

References

Air Force Instructions (AFI) 40-201, *Managing Radioactive Materials in the USAF*.

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Prevention, and Health (AFOSH) Program*.

Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.94, *Ventilation*.

OSHA 29 CFR 1910.107, *Spray Finishing Using Flammable and Combustible Materials*.

Air Force Occupational Safety and Health (AFOSH) Standard 48-1, *Respiratory Protection Program*.

AFOSH Standard 91-22, *Walking Surfaces, Guarding Floor and Wall Openings and Holes, Fixed Industrial Stairs, and Portable and Fixed Ladders* (formerly designated as AFOSH Standard 127-22).

AFOSH Standard 91-31, *Personal Protective Equipment* (formerly designated as AFOSH Standard 127-31).

AFOSH Standard 91-43, *Flammable and Combustible Liquids* (formerly designated as AFOSH Standard 127-43).

AFOSH Standard 91-56, *Fire Protection and Prevention* (formerly designated as AFOSH Standard 127-56).

AFOSH Standard 161-2, *Industrial Ventilation*.

National Fire Protection Association (NFPA) Standard 10, *Standard for Portable Fire Extinguishers*.

NFPA Standard 12, *Standard on Carbon Dioxide Extinguishing System*.

NFPA Standard 12a, *Standard on Halon 1301 Fire Extinguishing Systems*.

NFPA Standard 12b, *Standard on Halon 1211 Fire Extinguishing Systems*.

NFPA Standard 13, *Standard for the Installation of Sprinkler Systems*.

NFPA Standard 17, *Standard for Dry Chemical Extinguishing Systems*.

NFPA Standard 33, *Spray Application Using Flammable and Combustible Materials*.

NFPA Standard 70, *The National Electrical Code (NEC)*.

NFPA Standard 86, *Standard for Ovens and Furnaces*.

NFPA Standard 91, *Standard for Exhaust Systems for Air Conveying of Materials*.

Abbreviations and Acronyms

AFI—Air Force Instruction (new designation)

AFOSH—Air Force Occupational Safety and Health

AFSC—Air Force Safety Center

C—Celsius
CFR—Code of Federal Regulations
DRU—Direct Reporting Unit
F—Fahrenheit
FOA—Field Operating Agency
HQ—Headquarters
MAJCOM—Major Command
NEC—National Electrical Code
NFPA—National Fire Protection Association
NIOSH—National Institute for Occupational Safety and Health
OSHA—Occupational Safety and Health Administration
PDO—Publishing Distribution Office
psi—Pounds Per Square Inch
USAF—United States Air Force
WWW—World-Wide Web

Terms

Aerated Solid Powders.—Aerated solid powders are powdered materials used as a coating which will be fluidized within a container by passing air uniformly from below. This forms a fluidized powderbed for dipping the part to be coated in a manner similar to that used in liquid dipping. Such beds are also used as sources for powder spray operations.

Approved.—Listed and approved by Underwriter's Laboratories, Inc., Factory Mutual Engineering Corporation, The Bureau of Mines, National Institute for Occupational Safety and Health, The American National Standards Institute, The National Fire Protection Association, or other nationally recognized agencies which list, approve, test, or develop specifications for equipment to meet fire protection, health, or safety requirements.

Auto-Ignition Temperature.—The lowest temperature at which a flammable gas or vapor-air mixture will ignite from its own heat source or a contacted heated surface without necessity of spark or flame.

Combustible Liquid.—A liquid having a flashpoint at or above 100 degrees F (37.80 Celsius [C]).

Drying Oven.—The apparatus used to speed the drying process.

Flammable Liquid.—A liquid having a flashpoint below 100 degrees F (37.80 C) closed cup test and having a vapor pressure not exceeding 40 pounds psi at 100 degrees F (37.80 C).

Flashpoint.—The minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

Fluidized Bed.—A container holding powder coating material aerated from below to form an air-supported expanded cloud of such material. An electrostatic fluidized bed is electrically charged opposite to the charge of the object to be coated. The object is transported through the container

immediately above the charged and aerated materials in order to be coated.

May.—Indicates an acceptable or satisfactory method of accomplishment.

Shall.—Indicates a mandatory requirement.

Should.—Indicates a preferred method of accomplishment.

Spraying Area.—Any area in which quantities of flammable vapors or mists or combustible residues, dusts, or deposits are present due to spraying processes.

Spray Booth.—A power-ventilated structure provided to enclose or accommodate a spraying operation. These structures are designed to confine, limit, and control the escape of spray, vapor, and residue. A water wash spray booth is one equipped with a water washing system designed to minimize residues entering exhaust ducts and to permit the recovery of overspray finishing material. A dry spray booth is one not equipped with a water washing system as described above.

Will.—Is also used to indicate a mandatory requirement and to express a declaration of intent, probability, or determination.

Attachment 2

INTERIOR SPRAY FINISHING CHECKLIST

This is not an all-inclusive checklist. It simply highlights some critical items in this standard. Other requirements exist that are not included in the checklist. Where appropriate, MAJCOMs, DRUs, FOAs, local safety personnel, and supervisors will add to this checklist to include command or individual shop-unique requirements or situations.

A2.1. Do functional managers assure spray painting operations are closely supervised and equipment is in serviceable condition? Reference paragraph 2.1.1.

A2.2. On all air-type spraying equipment is a pressure regulator valve installed in the air line between the compressor and painting equipment? Reference paragraph 2.1.1.

A2.3. Is a pressure relief valve and a pressure gauge installed between the pressure regulator and pressurized paint containers and (or) spray guns? Reference paragraph 2.1.1.

A2.4. Are pressure relief valves set to open at pressures not more than 10 pounds above the required working pressure? Reference paragraph 2.1.1.

A2.5. Are painters' ladders, scaffolds, lifelines, and other equipment inspected prior to use to be certain they are in safe condition? (See AFOSH Standards 91-22, 91-31, and 91-43) Reference paragraph 2.1.2.

A2.6. Is paint or dope mixing done in designated, adequately ventilated rooms constructed of fire-resistant materials? Reference paragraph 2.1.3.

A2.7. Are mixing rooms provided with a floor drain to make it possible to wash down spills? Reference paragraph 2.1.3.

A2.8. Do local installations ensure collection sumps are installed in the floor drain system and (or) that the waste water treatment plant can process the spillage? Reference paragraph 2.1.3.

A2.9. If this is not the case, (see question A2.8), have local installations developed alternate means of cleaning up the spillage? Reference paragraph 2.1.3.

A2.10. When possible, are paints mixed in covered areas out of doors? Reference paragraph 2.1.3.

A2.11. Are all sources of ignition prohibited in mixing areas? Reference paragraph 2.1.3.

A2.12. Do all electrical fixtures or equipment on or within 20 feet of designated paint preparation areas meet the requirements of NFPA Standard 70 for Class 1, Division 1 locations? Reference paragraph 2.1.3.

A2.13. Are all air hoses checked to assure they are properly connected to both their pipe outlets and the equipment to be used? Reference paragraph 2.1.4.

A2.14. To prevent hose whipping, is the loose end secured prior to connecting hose to a compressed air outlet? Reference paragraph 2.1.4.

A2.15. When compressed air is used in areas where employees are working, are necessary precautions taken to avoid directing the air toward a fellow worker? Reference paragraph 2.1.4.

A2.16. Are hose lines checked for evidence of wear and replaced as needed? Reference paragraph 2.1.4.

A2.17. Are street clothing and protective clothing kept in separate lockers? Reference paragraph 2.1.5.

A2.18. Is working clothing stored in metal lockers vented at top and bottom? Reference paragraph 2.1.5.

A2.19. Are all wiping rags kept in self-closing metal containers? Reference paragraph 2.1.5.

A2.20. Is paint stored in work shops kept in tightly covered metal containers? Reference paragraph 2.1.5.

A2.21. Do personnel engaged in painting and paint removal wear protective clothing, respiratory devices if required, and appropriate face, eye, and hand protection? Reference paragraph 2.1.6.

A2.22. Is clothing changed, as needed, to minimize body contamination and reduce fire hazard? Reference paragraph 2.1.6.

A2.23. Do personnel engaged in the application of dopes and paints wear an apron or equivalent protection impervious to paints, solvents, and dopes? Reference paragraph 2.1.6.

A2.24. Are these aprons and clothing kept clean, and when not in use hung in ventilated metal lockers? Reference paragraph 2.1.6.

A2.25. Do personnel who are engaged in preparing surfaces for painting by abrasive techniques, wear goggles to protect their eyes from chips and flying particles? Reference paragraph 2.1.7.

A2.26. Are goggles and rubber gloves worn while acids, lye, or noxious cleaning materials are being used? Reference paragraph 2.1.7.

A2.27. Has the use of radioactive paint been approved by the base radiation protection officer, prior to its use? Reference paragraph 2.2.1.

A2.28. Is the base bioenvironmental engineer consulted for specific advice on respiratory protection required for specific painting activities? Reference paragraph 2.2.3.

A2.29. Do respiratory protective devices satisfy the requirements of AFOSH Standard 48-1? Reference paragraph 2.2.3.

A2.30. Has a program for the maintenance and care of respirators been established by functional managers? Reference paragraph 2.2.3.

A2.31. Do shop supervisors ensure workers receive instructions in the care and fitting of respirators? Reference paragraph 2.2.3.

A2.32. Do workers keep their hands and face clean, change contaminated clothes, and keep their hands and soiled objects kept out of their mouths? Reference paragraph 2.2.4.

A2.33. Is NO food or drink brought into, or consumed, in paint and dope shops? Reference paragraph 2.2.4.

A2.34. Do personnel wash their hands prior to smoking or consuming food in other areas? Reference paragraph 2.2.4.

A2.35. Are liquid, solid, and gaseous waste products from painting and paint removal operations disposed of according to local state air, water, and solid waste pollution control laws and as specified and approved by the Base bioenvironmental Engineer and the base civil engineer? Reference paragraph 2.2.5.

A2.36. Are personnel aware of flammable paints, lacquers, dopes, varnishes, shellacs, solvents, thinners, dilutants, and paint removers? Reference paragraphs 2.3.2. and 2.3.3.

A2.37. Do solvent materials selected to do the residual clean up after the initial removal, have a flash-point of 140 degrees F or above? Reference paragraph 2.3.4.

A2.38. Is extreme caution employed to ensure there are no ignition sources in the area and ventilation is adequate to remove flammable vapors when using Methyl Ethyl Ketone (MEK)? Reference paragraph 2.3.5.

A2.39. Is storage of paints and solvents according to AFOSH Standard 91-43? Reference paragraph 2.3.6.

A2.40. Are contaminated materials, i.e., solvent or paint-soiled rags, paper towels, and craft paper, removed and placed in approved self-closing metal containers plainly marked to indicate the contents? Reference paragraph 2.3.8.

A2.41. At the end of each day or shift, are these containers emptied or removed to an approved location outside the shop for pickup and disposal? Reference paragraph 2.3.8.

A2.42. Do fire suppression sprinklers installed in spray finishing areas conform to NFPA Standard 12 provisions for extra-hazardous occupancy? Reference paragraph 2.3.9.

A2.43. Are portable fire extinguishers installed near all paint spraying areas? Reference paragraph 2.3.10.

A2.44. Are ventilation and exhaust systems according to NFPA Standard 91 provisions and do they also conform to the provisions of this section? Reference paragraph 2.4.1.

A2.45. Is mechanical ventilation in operation while spraying operations are being conducted and for a sufficient time thereafter to assure vapors are completely exhausted? Reference paragraph 2.4.1.

A2.46. Is adequate makeup air provided? Reference paragraph 2.4.1.

A2.47. Is the fan-rotating element and its casing non-sparking? Reference paragraph 2.4.2.

A2.48. Are ample clearances provided to prevent friction-caused fire hazards? Reference paragraph 2.4.2.

A2.49. Are fan blades mounted on a shaft rigid enough to maintain alignment when the fan is operating under full load? Reference paragraph 2.4.2.

A2.50. Are exhaust ducts protected against mechanical damage, properly supported, and normally have a separation of at least 18 inches from combustible materials? Reference paragraph 2.4.3.

A2.51. Are ducts periodically inspected for accumulation of paint deposits and cleaned as needed? Reference paragraph 2.4.3.

A2.52. Is air exhaust from spray operations directed so it will not contaminate makeup air being introduced into the spraying area or other ventilation intakes? Reference paragraph 2.4.4.

A2.53. Is the terminal discharge point at least 6 feet from any combustible exterior wall or roof, unless the spray booth exhaust terminal is from a water wash spray booth? Reference paragraph 2.4.4.

A2.54. Are freshly sprayed articles dried only in spaces with adequate ventilation to prevent the formation of explosive vapors? Reference paragraph 2.4.5.

A2.55. If adequate and reliable ventilation is not provided, are such drying spaces considered a spraying area and applicable precautions taken in consideration of the type spraying being performed? Reference paragraph 2.4.5.

A2.56. Are electric motors driving exhaust fans not placed inside booths or ducts? Reference paragraph 2.4.6.

A2.57. Are drive belts entering the duct or booth enclosed or guarded? Reference paragraph 2.4.6.

A2.58. Storage and Handling:

A2.58.1. Are the quantity of paints, lacquers, thinners, solvents, and other flammable and combustible liquids kept near spraying operations limited to a 1 day's supply? Reference paragraph 2.5.1.

A2.58.2. Is bulk storage of these liquids in a separate building, detached from other buildings, or in rooms specifically designed and constructed to meet flammable storage room requirements? Reference paragraph 2.5.1.

A2.58.3. Are original closed containers, approved portable tanks, approved safety cans, or a system of piping used for bringing flammable and combustible liquids into spray finishing rooms? Reference paragraph 2.5.2.

A2.58.4. Is the withdrawal of liquids from containers and the filling of containers including portable mixing tanks done only in a mixing room or in a spraying area when the ventilating system is in operation? Reference paragraph 2.5.3.

A2.58.5. Are precautions taken to protect against liquid spillage? Reference paragraph 2.5.3.

A2.58.6. When flammable or combustible liquids are transferred from one container to another, are both containers effectively bonded and grounded? Reference paragraph 2.5.4.

A2.58.7. Are piping systems used to transfer fluids properly bonded and grounded? Reference paragraph 2.5.4.

A2.59. Electrical:

A2.59.1. Does electrical wiring and equipment conform to the provision of NFPA 70? Reference paragraph 2.6.1.

A2.59.2. Is electrical wiring located in spray areas kept in rigid metal conduit, type MI cable, or in metal boxes or fitting containing no tapes, splices, or terminal connections? Reference paragraph 2.6.1.

A2.59.3. Are all electrical equipment within 20 feet of any spraying area of a non-spark-producing design? Reference paragraph 2.6.2.

A2.59.4. Are all electrical lamps within 20 feet of any spraying area totally enclosed to prevent hot particles from falling should breakage occur? Reference paragraph 2.6.3

A2.59.5. Are all metal parts of spray booths, exhaust ducts, and piping systems conveying flammable or combustible liquids or aerated combustible solids electrically grounded? Reference paragraph 2.6.4.

A2.59.6. Are electric heaters used to raise the temperature of the spraying media approved for specific application and location? Reference paragraph 2.6.5.

A2.60. Location of Paint and Dope Shops and of Spray Finishing Operations.

A2.60.1. Are paint and dope shops located in separated one-story buildings with fire-resistant floors, walls, and ceilings? Reference paragraph 2.7.1.

A2.60.2. Are paint and dope shops provided with automatic sprinkler protection? Reference paragraph 2.7.1.

A2.60.3. Are spray finishing operations located and protected to minimize possible damage to other property by fire or by extinguishing agents? Reference paragraph 2.7.2.

A2.61. Spray Painting of Aircraft.

A2.61.1. Is spray painting of an entire aircraft permitted only in hangars specifically designed for this purpose? Reference paragraph 3.1.1.

A2.61.2. When spray painting aircraft, are the aircraft isolated and adequate fire prevention measures taken? Reference paragraph 3.1.1.

A2.61.3. When such work is performed, is ventilation provided and does the bioenvironmental engineer conduct periodic checks for adequacy of ventilation according to AFOSH Standard 48-2? Reference paragraph 3.1.1.

A2.61.4. Are all aircraft properly grounded and all sources of ignition removed from the area? Reference paragraph 3.1.1.

A2.61.5. Are all electrical devices and equipment of an approved explosion-proof type? Reference paragraph 3.1.1.

A2.61.6. Is smoking prohibited? Reference paragraph 3.1.1.

A2.61.7. Are all spray areas kept free from the accumulation of deposits of combustible residues? Reference paragraph 3.1.2.

A2.61.8. Are all scraping tools non-sparking? Reference paragraph 3.1.2.

A2.61.9. Are the use of solvents for cleaning purposes restricted to those having flashpoints at or above 100 degrees F? Reference paragraph 3.1.2.

A2.61.10. Are rags, waste, and other paint and dope-saturated materials placed in safety containers with self-closing lids? Reference paragraph 3.1.2.

A2.61.11. Are containers emptied daily? Reference paragraph 3.1.2.

A2.61.12. Whenever operations involving sanding, rubbing, or wiping surfaces are to be performed, are aircraft surfaces grounded to preclude the build-up of static electricity? Reference paragraph 3.1.4.

A2.62. Painting Radio and Radar Equipment:

A2.62.1. Is smoking prohibited within 50 feet of painting operations? Reference paragraph 3.2.1.

A2.62.2. Do paint shop personnel wear approved respiratory protective devices as recommended by bioenvironmental engineering? Reference paragraph 3.2.2.

A2.62.3. While painting, do personnel wear gloves or coat their hands with approved creams to guard against skin irritation? Reference paragraph 3.2.2.

A2.62.4. Are radio and radar equipment that have been sprayed, placed in the open air for several hours to prevent vapors from being ignited? Reference paragraph 3.2.3.

A2.62.5. Is emery paper or steel wool restricted from use on radio or radar equipment until the vapors have totally dissipated? Reference paragraph 3.2.3.

A2.62.6. Is fire prevention equipment checked regularly with particular attention given to automatic sprinkler heads? Reference paragraph 3.3.2.

A2.62.7. Are sprinklers protecting spraying areas kept free from deposits by frequent or daily cleaning? Reference paragraph 3.3.2.

A2.62.8. Is the entire electrostatic unit checked daily? Reference paragraph 3.3.3.

- A2.62.9. Are insulators on electrodes and conductors kept dry and cleaned frequently to prevent flashover? Reference paragraph 3.3.5.
- A2.62.10. Are the power unit and ground nozzle turned off to discharge any remaining charge within the system before cleaning a nozzle or attempting to work on any gun? Reference paragraph 3.3.5.
- A2.62.11. Are only spark-resistant tools used during cleaning operations? Reference paragraph 3.3.5.
- A2.62.12. Are manual grounding wires available and are employees who work with electrostatic equipment familiar with their use? Reference paragraph 3.3.6.
- A2.62.13. Are all metal parts, including guard rails, shields, barriers, and enclosures in the vicinity of a unit, grounded to prevent static buildup? Reference paragraph 3.3.6.
- A2.62.14. During manual spraying operations, do painters hold electrostatic spray guns in their bare hands? Reference paragraph 3.3.7.
- A2.62.15. Are spray room floors grounded? Reference paragraph 3.3.7.
- A2.62.16. When a gun is not in use is it hung so the nozzle is within 4-inches of a grounded conductor? Reference paragraph 3.3.7.
- A2.62.17. Are only properly trained, qualified, and physically-fit personnel permitted to work around electrostatic apparatus? Reference paragraph 3.3.8.
- A2.62.18. Are warning signs designating the process zone as dangerous posted? Reference paragraph 3.3.9.
- A2.62.19. Is a red “ON” light, interlocked into the power transformer circuit, also provided? Reference paragraph 3.3.9.
- A2.62.20. Do workers ensure they NEVER point an airless spray gun at any part of their body? Reference paragraph 3.4.2.1.
- A2.62.21. Do workers make sure they do not disconnect a gun from the fluid hose, or the hose from the pump, until the pressure has been released from the hose? Reference paragraph 3.4.2.2.
- A2.62.22. Are guns equipped with trigger guards and a safety lock? Is the lock locked in the non-operating position, except when the gun is actually in use? Reference paragraph 3.4.2.3.
- A2.62.23. Are all hose connections and fittings tight and not leaking? Reference paragraph 3.4.2.4.
- A2.62.24. Are all fluid hoses checked for weak or worn spots? Reference paragraph 3.4.2.5.
- A2.62.25. Do workers ensure they do NOT pass their fingers over the gun orifices to clean it? Reference paragraph 3.4.2.6.
- A2.62.26. Is the object being sprayed, as well as the spray gun, grounded to prevent static electricity from being created? Reference paragraph 3.4.2.7.
- A2.62.27. Are periodic continuity checks performed to ensure the hose ground wire is intact? Reference paragraph 3.4.2.7.
- A2.62.28. Does the operator wear eye protection and gloves to guard against accidental contact with the spray? Reference paragraph 3.4.2.8.

A2.62.29. Is respiratory protective equipment worn if exhaust ventilation is not available? Reference paragraph 3.4.2.8.

A2.63. Paint Spray Booths:

A2.63.1. Are filter pads and filter rolls inspected after each painting operation and replaced when necessary? Reference paragraph 3.5.2.1.

A2.63.2. Are interlocks used with automatic-advanced roll filters to stop the spraying operation should the roll advance mechanism fail to work? Reference paragraph 3.5.2.2.

A2.63.3. Are both filter pads and rolls changed when changing from one type coating material to another if the two materials are chemically dissimilar? Reference paragraph 3.5.2.4.

A2.63.4. Are discarded filter pads and rolls removed from the area daily unless water-filled metal containers are provided to hold them safely immersed until disposal? Reference paragraph 3.5.2.5.

A2.63.5. Are baffle plates, if used, made of noncombustible material and readily removable or accessible on both sides for cleaning? Reference paragraph 3.5.3.

A2.63.6. Are adequate fire extinguishers provided to handle the most flammable of coating materials being used? Reference paragraph 3.5.4.

A2.63.7. Is the use or carrying of matches, lighters, or other spark or flame-producing devices prohibited in or adjacent to spray booths? Reference paragraph 3.5.6.

A2.63.8. Are containers supplying spray nozzles of the closed type or provided with metal covers that are kept closed? Reference paragraph 3.5.7.

A2.63.9. Are containers under pressure exceeding atmospheric pressure provided with a visible pressure gauge and provided with both a relief valve and a shut-off valve? Reference paragraph 3.5.7.

A2.63.10. Are pressure hoses and couplings regularly inspected for poor condition and replaced as needed? Reference paragraph 3.5.8.

A2.64. Portable Paint Spray Equipment:

A2.64.1. Is the air compressor equipped with an ASME-rated air tank, a visible pressure gauge on the tank, a pressure reducer with its own gauge, a guard fully enclosing the drive belt and pulley, and a pressure-limiting switch to shut down the compressor when the system's working pressure has been reached? Reference paragraph 3.6.2.

A2.64.2. Is the equipment securely mounted on a wheeled carriage for portability? Reference paragraph 3.6.2.

A2.64.3. If separate paint pressure tanks are used, are they equipped with a gauge and a relief valve to prevent overpressure? Reference paragraph 3.6.3.

A2.64.4. Are hoses rated for the maximum working pressure of the system? Reference paragraph 3.6.3.

A2.64.5. Has a preventive maintenance program been implemented by all organizations using this equipment to cover periodic inspections and testing of all components? Reference paragraph 3.6.4.1.

A2.64.6. Is the storage of compressors, hoses, paint pressure tanks, and spray guns in areas designated and approved by the base civil engineer? Reference paragraph 3.6.4.2.

A2.64.7. Are all paint pressure tanks and spray guns cleaned after each use and before being stored? Reference paragraph 3.6.4.3.

A2.65. Aerosol Cans of Spray Paint:

A2.65.1. Are pressurized cans of spray paint stored according to AFOSH Standard 91-43? Reference paragraph 3.7.2.1.

A2.65.2. Do supervisors ensure office desks are NOT used for the storage of pressurized cans of spray paint? Reference paragraph 3.7.2.1.

A2.65.3. Are office store rooms being used for storage of pressurized cans of spray paint approved by the local fire department? Reference paragraph 3.7.2.1.

A2.65.4. Is the disposal of empty cans according to AFOSH Standard 91-43? Reference paragraph 3.7.2.2.

A2.65.5. Are malfunctioning cans still containing paint under pressure disposed of according to AFOSH Standard 91-43? Reference paragraph 3.7.2.2.

A2.65.6. Do supervisors ensure office waste cans are NOT used for the disposal of cans of spray paint or for the disposal of wiping rags? Reference paragraph 3.7.2.2.

A2.65.7. Are wiping rags and other waste materials disposed of in self-closing metal containers labeled to indicate the contents? Reference paragraph 3.7.2.2.

A2.65.8. Is protective equipment utilized? Reference paragraph 3.7.2.3.

A2.66. Drying Ovens:

A2.66.1. Do ovens used to dry flammable finishes, meet the criteria in NFPA 86 for Class A ovens? Reference paragraph 3.8.1.

A2.66.2. Do workers avoid using the spray booths or rooms for drying purposes? Reference paragraph 3.8.2.

A2.66.3. Do supervisors ensure open-flame drying ovens are NOT installed in a spraying area? Reference paragraph 3.8.3.

A2.66.4. Is the exhaust air adequately vented from the oven? Reference paragraph 3.8.4.

A2.66.5. Does the wiring for drying ovens and associated equipment conform with NFPA 70? Reference paragraph 3.8.5.

A2.66.6. Are metal parts of drying ovens bonded and grounded? Reference paragraph 3.8.6.

A2.66.7. Do supervisors prohibit spraying operations in the proximity of an operating drying oven? Reference paragraph 3.8.7.

A2.66.8. Are signs posted in the vicinity of operating drying ovens to warn of heat and caution against conducting spraying operations? Reference paragraph 3.8.8.

A2.67. Powder Coating:

A2.67.1. Is forced exhaust ventilation mandatory? Reference paragraph 3.9.2.1.

A2.67.2. Are collectors incorporated with the ventilation system to trap all excess powder? Reference paragraph 3.9.2.1.

A2.67.3. Is the area free of powder dust? Reference paragraph 3.9.2.2.

A2.67.4. Are the electrostatic fluidized beds that utilize transformers located outside the powder coating area? Reference paragraph 3.9.2.3.

A2.67.5. Are all metal parts of the fluidized bed electrically bonded and grounded? Reference paragraph 3.9.2.4.

A2.67.6. Are electrostatic hand guns grounded? Reference paragraph 3.9.2.5.

A2.68. Organic Peroxide Coating:

A2.68.1. Is equipment used for organic peroxide coating prevented from interchange with that used for any other application? Reference paragraph 3.10.2.1.

A2.68.2. Are noncombustible materials used for clean-up purposes? Reference paragraph 3.10.2.2.

A2.68.3. Do supervisors ensure organic peroxide materials are NOT near any source of heat? Reference paragraph 3.10.2.3.

A2.68.4. Is smoking not permitted and "NO SMOKING" signs posted in areas where organic peroxides are stored, mixed, or applied? Reference paragraph 3.10.2.4.

A2.68.5. Are non-sparking tools used in areas where these materials are stored, mixed, or applied? Reference paragraph 3.10.2.5.

A2.68.6. Are respirators, gloves, and protective clothing required? Reference paragraph 3.10.2.6.

A2.68.7. Do spraying operations involving the use of organic peroxides conducted in sprinkler spray booths meet the requirements of AFOSH Standard 48-2? Reference paragraph 3.10.2.7.

A2.68.8. Are the quantity of peroxides kept in the processing area the minimum required for daily operations? Reference paragraph 3.10.2.8.